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INTELLIGENCE MEMORANDUM

THE SOVIET SIXTH FIVE YEAR PLAN (1956-60)

CIA/RR IM-426

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FOREWORD

This memorandum on the Sixth Five Year Plan (1956-60) is based upon an analysis of the draft of the Plan which was released on 15 January 1956 and the materials of the 20th Party Congress on 14 February 1956. The primary emphasis of this memorandum is upon an examination of the policies and programs contained within the Plan itself. A more detailed estimate of the probable economic situation in 1960 and 1961 is made in ORR Project 10.803, which is the ORR contribution to NIE 11-4-56, Soviet Capabilities and Probable Courses of Action 1955-61 (to be published). Based upon detailed examination of additional data, some of the preliminary estimates in this memorandum may be changed, but the primary evaluation of the Plan is believed valid.

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THE SOVIET SIXTH FIVE YEAR PLAN (1956-60)*

Summary and Conclusions

The Sixth Five Year Plan (1956-60) requires that the USSR utilize its resources in a manner that will most efficiently develop an economic program which will permit the USSR to enter into industrial competition with the West and to strengthen its military capabilities.

To achieve these goals, the USSR will (1) give priority to the expansion of heavy industry; (2) expand the agricultural base; (3) strengthen the military establishment; (4) attempt to content the consumer, while increasing total sums directed to capital investment and the defense effort; (5) support a more elaborate intra-Bloc division of labor among the countries of the Sino-Soviet Bloc; and (6) increase its ability to penetrate Free World markets.

A declining rate of additions to the labor force will require drastic efforts to increase labor productivity in order to meet the sizable production goals of the program. Increased replacement of inefficient equipment, the adoption of the most advanced technical improvements, and increased automation of processes will all be necessary to this end. Should the goals for industrial labor productivity be underfulfilled, extra workers will be assigned to industry, as in the past, from other sectors.

It is planned that industrial production in 1960 will be 65 percent greater than in 1955 compared with the increase of 85 percent realized in 1955 over 1950. The rate of increase is still quite high, and it should be noted that the USSR surpassed the initial industrial goals of the Fifth Five Year Plan (1951-55) by a significant margin. It is estimated that Soviet industrial production in 1960 will be 39 percent of the US equivalent compared with 28 percent in 1955.

* The estimates and conclusions contained in this memorandum represent the best judgment of ORR as of 1 March 1956.

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The new Plan calls for a major effort to increase the power resources of the country. Production of electric power is to be increased 88 percent.

Steel production is to increase 51 percent. The increase in production of machinery and metalworking products is to be 80 percent compared with 120 percent for 1955 over 1950.

The railroad system is to be substantially modernized by a new dieselization and electrification program, and its capacity increased by more widespread introduction of automatic block signaling equipment and centralized traffic control.

Increased production of consumer goods will cause some moderate improvement in living standards. In addition, a 41-hour workweek is to be introduced by 1960, and the housing construction program is to be expanded.

An ambitious agricultural program is planned, based largely on expanded grain production from the "new lands," increased harvests of corn, and increased production of meat and dairy products.

Capital investment is to increase at a high rate. The 5-year total is to be 990 billion rubles, 67 percent more than the total for 1951-55. An important change in the pattern of investment will be the increased replacement of inefficient equipment. Expanded introduction of automation and improved technical processes also are important characteristics of the new Plan.

In general, the Fifth Five Year Plan was successfully fulfilled in industry, but there were some shortfalls in the agricultural sector and in the production of consumer goods. Despite a relatively low increase in investment in the machine-construction industry, goals were over-fulfilled in this vital sector. The expansion of power output did not keep pace with the general increases in industrial production, however, and the Sixth Five Year Plan stresses special effort to remedy this situation.

Notwithstanding a period of policy reexamination after Stalin's death, the Fifth Five Year Plan may be characterized as one continuing primary emphasis upon expansion of heavy industry.

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Policy debate being resolved once more, the USSR considers the continued expansion of heavy industry as the most important guarantee of economic strength in 1960 and as the basis for continuation of a fast rate of growth after 1960. There is little reason to believe that these plans will not be met unless the world situation deteriorates, requiring an extensive Soviet mobilization in the early part of the period, or an internal economic or political crisis develops. If neither of these situations occurs, even a significant failure to achieve industrial productivity goals could be counteracted by above-Plan additions to the industrial labor force from an unallocated increase in the labor force or from other sectors of the economy. The Plan projects a very low rate of increase in the industrial labor force; the addition of somewhat less than a million workers above and beyond the Plan would counteract the loss of production if the industrial productivity increase were no more than in the Fifth Five Year Plan (44 percent) compared with the planned increase of 50 percent. As the Plan appears to contain a labor reserve, an addition of this size to the labor force would not endanger its fulfillment in other sectors.

The Plan for agriculture appears overly ambitious and probably will be underfulfilled, leading, in addition, to underfulfillment of those plans for the light and food industry, which depend upon Soviet agriculture for raw materials. Unless material shortages develop or manpower must be shifted to heavy industry, the plans for consumer durables appear feasible.

I. Guiding Principles of the Plan.

The Sixth Five Year Plan is predicated on the main economic task of the USSR, which is defined as being "to overtake and surpass the most developed capitalist countries as regards per capita production."* The goal is not only economic competition with the US, but also "the further consolidation ... of the unbreakable defensive capacity [for the USSR]." Relative to US industrial production, achievement of the goals will increase the industrial production of the USSR from 28 percent in 1955 to 39 percent in 1960. In the aggregate, the old Stalin goals for 1960-65, established in 1946, are to be increased as follows:

* The Plan does not anticipate that this will occur by 1960, however.

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Million Metric Tons*		
<u>Product</u>	<u>Stalin Goal</u>	<u>Sixth Five Year Plan Goal</u>
Pig iron	50	53
Steel	60	68.3
Coal	500	593
Oil	60	135

More than in any preceding plan, the keyword of the new Plan is efficiency -- efficient use of the mineral and agricultural resources of the USSR, efficient use of the labor force, and efficient use of "Socialist Accumulation," that share of the gross national product which cannot be consumed but must be kept available for defense and for investment. The USSR faces a high degree of simultaneous pressure upon its resources. It is strengthening its military capabilities, attempting to maximize its rate of economic growth, and endeavoring to keep Soviet consumers moderately appeased. Under such circumstances, the economic program for the next 5 years is taut, with little slack to absorb planning mistakes, plan underfulfillment, or natural catastrophes. It is a program which recognizes the possibility of peaceful "coexistence" and strong economic competition with the West but does not reject the possibility of war.

The economic policy of the Plan reflects six basic principles, which, when applied to specific problem areas, determine its basic characteristics. These six principles are as follows:

1. To Give Priority to the Expansion of Heavy Industry.

The extension of a priority to the expansion of heavy industry is not a new concept and has characterized the preceding plans. It is, however, a reversal of the emphasis during the "new course," at which time it was suggested by many Soviet economists that from time to time light industry could be given equal or higher expansion rates than heavy industry. The concept has now been explicitly rejected by the Central Committee.

* Tonnages throughout this memorandum are given in metric tons.

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2. To Expand the Agricultural Base.

The recent agricultural policy of the USSR and the new Plan both reflect recognition that the increase in population has been creating great pressure on the food supply and on the supply of those products of light industry which are based upon agriculture.

3. To Strengthen Military Capability.

The Plan is explicit in requiring that the military capability of the USSR be strengthened. In addition to the implication that the production of increasingly complex military end items will continue at a high level, several programs of the new Plan have great implications for Soviet military strength. Greatly increased production of instruments,* as planned, is essential both to the military program and to improved technology in industry. A sixfold expansion of productive capacity for heat-resistant alloys increases strategic, economic, and military production capabilities, as do the oxygen and ammonia production programs. The eastward expansion of industry into the more interior areas of the USSR, Kazakhstan, western Siberia, and Central Asia will place an increasing share of the war-supporting industry in the geographic area farthest from the Arctic, Pacific, and European bases of the Western nations. Much of the new railroad construction program will have the effect of creating additional lines parallel to the Trans-Siberian Railroad from Moscow all the way to Abakan, about 550 miles west of Lake Baikal.

Despite the long-range hydroelectric program which involves some long-term capital commitments, capital investment in general will not be so involved in long-term commitments as during 1951-55, because there is much less emphasis upon the building of entire new plants which would be several years under construction.

4. To Satisfy the Consumer While Increasing the Rate of Accumulation.

This principle embraces the competition between consumption and investment. In the new Plan, as in previous plans, investment wins out. Accumulation for investment (and defense) still will be accomplished by setting the increases in per capita real wages substantially

* The term instruments includes electronic and mechanical control systems.

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lower than the increases in per capita production. Although production of such consumer durables as washing machines and television sets can be rapidly expanded from the present small base, their importance in total consumption will remain small in 1960. Food, clothing, and housing will continue to be the predominating factors in the determination of the living standard, and these factors depend upon the weakest sectors of the economy, agriculture and construction. The Plan calls for smaller gains in real wages than those reported for 1951-55, and the doubtful prospects for the ambitious agricultural goals endanger even these targets.

5. To Support Intra-Bloc Division of Labor.

The Sixth Five Year Plan specifically refers to the expansion of a rational utilization of the economic resources and production capacities of the countries of the Sino-Soviet Bloc by means of coordinated development, specialization and cooperation in production, and the exchange of information and experience.

6. To Penetrate Markets in Underdeveloped Countries.

The penetration of markets in underdeveloped countries is not explicitly stated in the Plan but rather is implied in the Plan's goal of economic competition with the West, and made explicit by the offers of Soviet leaders to assist in the industrialization of underdeveloped countries. It is made meaningful by present efforts to penetrate the economies of the underdeveloped countries. It has been estimated that the USSR can increase greatly its effort in this direction without creating undue dependence on imported supplies, without undue diversion of resources necessary to its own development program, and with net gains, both economic and political.

II. Energy.

Despite the large existing energy base of the USSR, a continuing emphasis upon the expansion of heavy industry necessitates the expansion of goals for the production of fuels and energy which surpass the expansion of the preceding 5 years not only in absolute amount but in rate of expansion. Production of energy and fuels in the USSR for 1950, 1955, and the 1960 Plan is shown in Table 1.*

* Table 1 follows on p. 7.

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Table 1

Production of Energy and Fuels in the USSR
1950, 1955, and 1960 Plan

Category	1950	1955	1960 Plan
Coal (million metric tons)	261	391	593
Oil (million metric tons)	38	71	135
Electricity (billion kilowatt-hours)	91	170	320
Thermopower		147	251
Hydropower		23	59
Nuclear power		Negligible	10

The Sixth Five Year Plan specifies that the coal industry is to overcome the lagging of coal extraction behind the growing needs of the economy. To this end, coal extraction in 1960 is to be 200 million tons more than the 391 billion achieved in 1955. In view of the tightening labor supply, the emphasis is upon minimizing additions to the labor force in the coal industry. Improved mechanization and the increased use of strip mining are emphasized accordingly. An effect of this emphasis will be to increase capital investment in an effort to hold the present level of the labor force. Much of the additional output will be at higher cost than existing output, as more difficult extraction is encountered, such as the mining of narrow or steeply pitching coal seams.

Despite the great emphasis of the Plan on the generation of hydroelectric power, only 19 percent of the total electric power generated in 1960 will be hydroelectric power, with most of the remainder being thermoelectric power produced largely from coal sources. In 1960, 320 billion kilowatt-hours (kwh) are to be generated, of which 59 billion kwh are to be from hydroelectric stations, as against 170 billion kwh in 1955, with 23 billion kwh from hydroelectric stations. It is estimated that 10 billion kwh of the total will be generated by the atomic power stations specified in the Plan.

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A striking feature of the power plans is the hydroelectric power program, which is to increase the share of power now produced from water energy. Extensive construction is to continue in European Russia on the Volga, Kama, and Dnepr Rivers. A substantial long-range buildup, however, is to be concentrated in the area east of the Urals. Although the highlands south of the Siberian plain have long been known as the greatest potential source of hydroelectric power in the USSR, problems of efficient transmission caused development to await the creation of industrial centers in the nearby areas of Middle Asia. The extensive industrialization now planned for the area stretching from the Urals to Lake Baikal makes development of this power potential practical and essential. As a result, the two largest hydroelectric stations in the USSR, each with a capacity of 3.2 million kilowatts (kw), are to be built at Bratsk, where the Angara River joins the Oka River, and at Krasnoyarsk on the Yenisey River. Neither of these projects will be completed in 1960, although the first section of the Bratsk station is to be operative then. Nevertheless, adequate power will be available in the area by 1960, on the basis of other smaller stations to be completed.

This power program, demanding extensive investment in dams, stations, and transmission equipment, represents a long-term commitment of investment capital. For this reason, it may be of intelligence significance as a guide to indications. In the event of anticipation of hostilities, work would likely be slowed down on projects not near completion in order to permit the release of equipment and manpower for more urgent tasks.

The USSR is to move further toward its dream of a unified power grid by establishing a single European power grid, a unified Trans-Caucasus grid, and a unified Novosibirsk-Irkutsk grid. Establishment of such unified grids will permit more efficient power distribution and greater ability to meet peak-load requirements.

The USSR has insufficient rainfall, and problems of seasonal water flow limit the operating capacity of the hydrostations. Hydroelectric power is not the panacea to the problems of a country industrializing rapidly and pressing ever harder upon its power resources. Coal-generated power becomes costly at any distance from the coalfields. As a result, nuclear power stations will receive great emphasis as possible answers to power problems in areas remote from coal and water sources and to the need for base load stations capable of operating at relatively steady year-round rates.

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Petroleum requirements in the USSR have been expanding rapidly and will continue to expand as mechanized agriculture and aviation continue their great growth, as the country embarks on its dieselization program for the railroads, and as the use of petroleum products as a chemical raw material increases. By 1960, output of petroleum products is to increase 91 percent above the 1955 total, or to 135 million tons. Such rapid growth creates a transport problem which is to be resolved by a sixfold growth in the pipeline transport of petroleum products. The need of the USSR for inexpensive fuel is to be met partially by an increase in the output of natural gas to 388 percent of the 1955 level. Eventually, natural gas will be used much more extensively as a feed material to the chemical industry.

III. Industry.A. Metallurgy and Industrial Materials.

The 1960 goals of the metallurgy and industrial materials industries call for a lower rate of growth than that achieved during 1951-55, except for the chemical industry and the building materials industry. Table 2 shows the trend in the production of metallurgical and industrial materials in the USSR.

Table 2

Production of Metallurgical and Industrial Materials in the USSR
1950, 1955, and 1960 Plan

Material	Million Metric Tons		
	1950	1955	1960 Plan
Pig iron	19	33	53
Steel	27	45	68.3
Rolled metal	21	35	52.7
Cement	10	22	55
Mineral fertilizers	5.5	9.6	19.6

The Sixth Five Year Plan projects a lower rate of increase for the production of crude steel than that achieved during 1951-55, 51 percent over 1955, as compared with the 66-percent increase achieved

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in 1955 over 1950. Nevertheless, the 1960 goal of 68.3 million tons of steel considerably exceeds the old Stalin goal of 60 million tons, and the planned increase in annual production of 23 million tons exceeds the 18-million-ton increase achieved in 1955 over 1950. In the steel industry of the US, production is to increase 15 million net tons per year by 1958. This expansion is roughly equal to the Soviet planned expansion.

A notable feature of the new Plan is its stress upon increasing capacity for the annual output of stainless steel and heat-resistant alloys by an additional 220 percent, of which the output of heat-resistant alloys would increase by 500 percent. This is a significant expansion in the type of material essential both to the military program and to the production of equipment with high-temperature and corrosion-resistant applications.

In the aggregate, projected increases in the annual production of nonferrous metals are to keep pace with the projected increases in industrial production. The planned increases, however, are less than those planned in the Fifth Five Year Plan. Especially striking are the reductions in the planned increase for production of lead and zinc. The greatest increase planned among the major nonferrous metals is 110 percent for aluminum. Production of refined copper is to increase 60 percent, as compared with 90 percent in the Fifth Five Year Plan. Growth in aluminum production is closely associated with growth in power supply, as the aluminum industry has extensive power requirements and reflects the relatively higher production cost of partially interchangeable copper. Indigenous supplies of refined copper in the USSR are insufficient; imports play an important role, and the relatively slow expansion in production which is planned is not likely to lead to self-sufficiency. Achievement of the copper production plans will be difficult, involving development of lower grade ore bodies in Kazakhstan. Substitution of other products, such as aluminum, for copper will continue wherever feasible. Goals for the production of nonferrous metals in the USSR in 1955 and 1960 are shown in Table 3.*

The chemicals industry covers a wide range of products. One group of products, plastics, has assumed increasing importance in the worldwide search for metals or metal substitutes capable of performing special tasks. Plastics have increasingly replaced metals in the struggle for cheaper materials, more convenient materials, or corrosion-resistant materials. Output of plastics in the USSR will increase greatly during 1955-60.

* Table 3 follows on p. 11.

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Table 3

Goals for Production of Nonferrous Metals in the USSR
1955 and 1960

Metal	Percent	
	1955 Plan as Increase over 1950	1960 Plan as Increase over 1955
Lead	170	42
Zinc	150	77
Aluminum	160	110
Copper, refined	90	60

Expansion of the chemicals industry will continue at a fast rate, especially in the field of synthetics. Output of synthetic rubber is to be 120 percent higher in 1960; synthetic alcohol, 90 percent; and synthetic fibers, 400 percent.

The agricultural program requires that the production of mineral fertilizers be accelerated, with 1960 production to increase 104 percent above 1955. Production of the basic industrial chemicals, such as ammonia, sulfuric acid, caustic soda, and calcined soda, is to increase at a rate slightly higher than the increase in industrial production.

The new Plan establishes an extensive building program for hydroelectric projects and for housing. As a result, although the Plan deemphasizes the construction of new structures in industry, the construction materials industry must continue to grow at a rapid rate. Production of cement is to increase to 55 million tons in 1960, roughly 2.5 times 1955 production. Special emphasis is given to production of prefabricated building materials and to prestressed concrete forms.

In general, an increased output of metals and industrial materials must be obtained primarily from construction of new producing units and accompanying increases of the labor force. Increased productivity will be gained largely by reducing the proportion of workers doing manual labor, which is, for example, 44 percent in the coal

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industry and 35 percent in ferrous metallurgy. Expansion of the ferrous and nonferrous metallurgy industries and the chemicals industry in the area between the Urals and Lake Baikal will require new enterprises and major additions to the labor force.

New production capacity must be commissioned for the planned production of 16.8 million tons of pig iron, 15.8 million tons of steel, 16.3 million tons of rolled metal, and 84 million tons of iron ore. New producing units are required to produce 58 percent of the planned additional output of refined copper, 80 percent of the aluminum, 66 percent of the lead, 40 percent of the nickel, 66 percent of the ammonia, 47 percent of the caustic soda, 70 percent of the soda ash, and 76 percent of the automobile tires.

Major technological improvements will be especially significant in the ferrous metals and chemicals industries. Although the level of technology in the Soviet steel industry already approaches that of the US, approximately 33 percent of the scheduled increase in production is to result from increased productivity of existing plants. A significant part of this increase will be effected by more extensive use of oxygen enrichment, particularly in open-hearth furnaces.

In the US chemicals industry, many of the most significant new technical developments increasing production efficiency have been in the field of intermediate products in the synthetic organics field. The USSR has not gone so far in this field, because of its predominant interest in expanding production of basic chemicals essential to the general buildup of heavy industry. In the future, this emphasis may be expected to shift more in favor of synthetic organics and improved technology in that field.

B. Machinery and Equipment.

After years of emphasis on the production of machinery and equipment, the production volume has become so sizable that the annual rate of increase has begun to drop off. This is true generally of the new Plan, even though in most cases the expansion of annual production to be reached by 1960 exceeds that of any other 5-year period, in absolute terms. Soviet production of machine tools exceeded US production in 1955 in number. Production of metal-forming machines, on the other hand, was significantly below US levels, a major use of such machines in the US being the production of consumer durables.

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Three major programs of the Sixth Five Year Plan are responsible for significant increases in the planned rate of growth for instruments,* tractors, and diesel and electric locomotives. The programs are automation, intensified mechanization of agriculture, and the dieselization and electrification program for the railroad system.

Significant improvements in technology are scheduled to have great impact upon the machinery and equipment sector. Renovation of old plants and equipment, automatization of processes, and reductions in the weight of end items are urged in an attempt to reduce production costs, increase labor productivity, and stretch the supply of metal. New producing units are required to fulfill the following planned increases: hydraulic turbines, 46 percent; transformers, 36 percent; metal-cutting machine tools, 35 percent; tractors, 31 percent; passenger railroad cars, 11 percent; and chemical equipment, 65 percent. In general, the major emphasis within this category of industry is upon increasing production from existing production units.

Goals for the production of machinery and equipment in the USSR, for 1955 and 1960 are shown in Table 4.**

C. Consumer Goods.

As a category of industry in the USSR, consumer goods includes the light and food industries. It is also meaningful to split the category into consumer durables and consumer nondurables, as these two classifications exhibit quite different growth characteristics. Consumer durables have been a very small component of the Soviet metal-working industry and are capable of great increases in growth rate because of the small current scale of production. This is true of television sets, refrigerators, sewing machines, and washing machines. Consumer nondurables, consisting largely of clothing and food products, have been much more essential to the Soviet consumer. Essentially the production of consumer nondurables has been closely related to Soviet agriculture, on which depends not only the supply of vital foodstuffs but also the wool and cotton for clothing. Growth rates for nondurables

* Increased production of instruments is required not only for the automation program but also for complex military end items and increased research and development.

** Table 4 follows on p. 14.

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Table 4

Goals for Production of Machinery and Equipment in the USSR
1955 and 1960

Product	Percent	
	1955 Plan as Increase over 1950	1960 Plan as Increase over 1955
Machine-building and metalworking equipment	120 <u>a/</u>	80
Instruments	170	247
Machine tools, metal-cutting	160 <u>b/</u>	91
Machines, forging, and presses	700 <u>c/</u>	91
Equipment, chemical <u>d/</u>	230	84
Equipment, metallurgical <u>d/</u>	85	63
Equipment, petroleum <u>d/</u>	250	148
Equipment, rolling	100	82
Ships, seagoing freighters and tankers	190	30
Motor vehicles	20	46
Tractors (in units)	50 <u>a/</u>	97

a. Actual 1955 output as increase over 1950.

b. Specified as large in Fifth Five Year Plan, not so stated in the Sixth.

c. Specified as heavy forging machines and presses in the Fifth Five Year Plan, not so stated in the Sixth.

d. Increase reported on value basis in Fifth Five Year Plan, on a tonnage basis in the Sixth.

have been much lower than for consumer durables. Table 5* shows the production of selected consumer goods in the USSR in 1950, 1955, and the 1960 Plan.

The targets for the output of consumer durables are within Soviet capabilities and will not of themselves endanger the increase in output of producer goods. Historically, however, the production of

* Table 5 follows on p. 15.

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consumer durables has suffered whenever industry has run short of material, every other branch of industry having prior claim in allocation.

Table 5

Production of Selected Consumer Goods in the USSR
1950, 1955, and 1960 Plan

Commodity and Unit	1950	1955	1960 Plan
Radio and television sets (million units)	1.1	4.0	10.2
Watches and clocks (million units)	7.6	19.7	33.6
Cotton fabrics (million meters)	3,899	5,904	7,270
Woolen fabrics (million meters)	155	251	363
Footwear (million pairs)	226	299	455
Industrial meat processing (million tons) a/	1.3	2.2	3.95
Butter and dairy products (million tons, milk basis) b/	8.5	13.5	25.2
Vegetable oil (million tons)	0.8	1.1	1.84
Fish haul (million tons)	1.7	2.7	4.2

a. Data apply to processing done by state enterprises.
Some private processing is done but is not represented in these figures.

b. Data apply to state production only.

Achievement of the plan for consumer nondurables is largely contingent upon accomplishment of the ambitious agricultural program.

In general, the consumer goods program of the Sixth Five Year Plan appears to call for modest gains in the standard of living of the Soviet consumer. Rates of increase for consumer goods in general will not be as high as those reached in 1953-55. The primacy of heavy industry in the allocation of investment and materials has been reaffirmed in the new Plan. Of somewhat more effect upon the individual Soviet citizen will be the new housing program and the 41-hour week to be put into effect by 1960.

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IV. Transport and Communications.

In general, the transport program of the Soviet Sixth Five Year Plan calls for growth in carrying capacity commensurate with the growth of industrial production; for a lesser share of the total product to be carried by rail in 1960; for improved transport between European USSR and the Far East; and for a substantial improvement of transport facilities in western Siberia and Kazakhstan, in support of the industrial and agricultural programs in that area.

In communications, the Plan calls for an accelerated program installing cable lines and increasing the capacity of automatic telephone exchanges. A 10,000-kilometer network of radio relay lines is to be put into operation.

The Plan establishes goals in the field of transport which continue the rate of increase displayed in the Fifth Five Year Plan. Railroad freight turnover, river cargo turnover, air cargo turnover, and pipeline transport are all to expand at approximately the same rate as that planned for 1951-55. The 1960 goal for sea cargo tonnage is 2.1 times the tonnage carried in 1955; the Fifth Five Year Plan called for a 55 to 60 percent increase. Motor freight turnover is to double in the new Plan, as compared with a planned 80 to 85 percent increase in 1951-55. Planned increases in the transport program of the USSR in 1955 and 1960 are shown in Table 6.

Table 6

Planned Increases in the Transport Program of the USSR
1955 and 1960

Category	1955 over 1950	1960 over 1955
Railroad freight turnover	35 to 40	42
River freight turnover	75 to 80	80
Sea cargo turnover	55 to 60	110
Motor freight turnover	80 to 85	100
Air freight turnover	100	100
Pipeline transport	400	500

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In the USSR the railroads carry approximately 85 percent of all freight turnover. Expansion of other types of transport at rates faster than expansion of rail freight turnover will reduce this percentage somewhat by 1960.

The Sixth Five Year Plan calls for the construction of 6,500 kilometers (km) of new lines, twice as much as constructed during 1951-55. Much of this increase is directed to the improvement of rail service in the "new lands" area, to improvement of rail transport between the Kuznets Basin and the Urals, and to the eventual establishment of a new rail link to Communist China by building a line eastward from Alma-Ata feeding toward the Chinese Sinkiang railroad project.

In addition, the Plan directs extensive replacement of rails, extension of the automatic block system and other safety devices, complete conversion to automatic coupling, and widely increased use of 4-axle freight cars. An extensive program is to be established for beginning conversion to diesel and electric locomotion, with diesels to be hauling from 40 to 45 percent of total rail freight in 1960. During the Plan period, production of steam locomotives will be discontinued.

In river transport the prime emphasis is upon greater efficiency of operation, to be obtained largely by measures designed to expedite two-way traffic on rivers and canals and by improvement of port facilities.

The aims of the program for sea transport are to develop seaports, to improve handling facilities at the ports, and to expand the sea fleet. Sea cargo turnover in 1960 is planned to double the 1955 turnover. This will give the Soviet merchant marine greatly increased potential for carrying East-West trade, for carrying intra-Bloc trade, and for commerce with the Far East.

The pipeline expansion program assumes great importance for movement of petroleum products to refining and consuming centers. The Plan establishes no unusual emphasis on expanded air freight operations. It does state, however, that new models of passenger planes will be introduced into service which will be faster and will have larger seating capacity. It is possible that a twin-jet model will be used on some flights.

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In motor transport, there is no evidence of intent to start a major roadbuilding program. Apparently, motor transport is still to be primarily of a short-haul nature despite a planned doubling of freight turnover. The Plan lays great stress upon more efficient utilization of vehicles and increased centralization of the vehicle park.

V. Agriculture.

The Sixth Five Year Plan continues the broad attack on three closely related factors which have historically held back Soviet agricultural growth -- limited natural resources, past underinvestment, and organizational difficulties. In general, the directives call for a continuation of the policies adopted since 1953. These include the development and completion of the "new lands" and corn programs, a rise in capital investment with a change in its composition, and the simultaneous extension of incentives to and controls over collective farmers. On the basis of these programs, output is to increase sharply, and Khrushchev has even declared that some of the targets can be met by the midpoint of the planning period. Despite Khrushchev's optimism, the goals of the program appear overoptimistic. The planned increases in agricultural production in the USSR in 1955 and 1960 are shown in Table 7.

Table 7

Increases in Agricultural Production in the USSR
1955 and 1960 Plan

Product	Percent	
	Actual	Plan
	1955 over 1950	1960 over 1955
Grains	29 a/	80
Flax fiber	49	35
Raw cotton	9	56
Sugar beets	47	54
Meat (slaughter weight) b/	30	100
Milk b/	19	95
Eggs b/	54	154
Wool	42	82

a. Distorted to unknown extent by inclusion of unripened corn.

b. State production. Past and future gains may be partly at the expense of private production.

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The attack on resource limitations is embodied both in the "new lands" program, now nearly completed, which extends grain cultivation into an area of high drought risk, and the corn scheme, which also encounters serious climatic difficulties. The Plan reaffirms both programs, envisioning neither an expansion nor a contraction of their previous scope. In combination, they seek to achieve adequate supplies of bread grains and a sharp improvement in fodder supplies, which in turn will support higher levels of livestock and improve the quality of the Soviet diet.

Investment has been raised and redirected in support of these programs and of traditional types of cultivation. Expenditures on mineral fertilizers are to rise, and large investments will be made in increasing livestock numbers, providing them with shelter, and mechanizing livestock operations, which presently are performed largely by hand. Except for expenditures for equipment the capital expenditures for resettlement in the "new lands" may be expected to decline after 1956. Investment in production of tractors and combines will continue to rise, with average annual deliveries during the Plan at about 2.5 times the 1953 rate. An important change is planned in the composition of the tractor park -- production of smaller, wheeled tractors for use in cultivating will increase much faster than the large, general-purpose tractors employed in grain production. The stress on corn, technical crops, vegetables, and potatoes is responsible for plans to increase the share of cultivator tractors to 58 percent of the 1960 tractor park in physical terms and 36 percent in horsepower terms as opposed to 46 percent and 24 percent, respectively, in 1955.

The Plan relies on increased labor productivity to achieve its ambitious agricultural goals. Labor quality will be improved by expanded training programs and the assignment of more graduate specialists to agriculture, twice as many as planned for the preceding 5 years. The total number of workers, however, is to remain relatively steady, although hopes have been voiced that eventually the traditional transfer of labor from agriculture to industry can be resumed. In the meantime, the productivity of state farm workers is to increase by 70 percent and of collective farmers by 100 percent during the Sixth Five Year Plan, although the Fifth Five Year Plan goal of 40 percent for all agriculture was not met. Failures corresponding to output underfulfillments are expected.

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Mechanizing livestock operations and the farming of corn and non-grain crops is one aspect of these productivity plans. Another aspect is the income incentives offered to collective farmers for greater efforts on communal tasks. A third is the more effective political controls exerted by the greatly strengthened Party apparatus in the countryside. Certain elements of the Plan and of contemporary Soviet pronouncements hint that in the future this third aspect may become increasingly important and that the perennial campaign to reduce or eliminate the private plot and the free market, which compete with collective employment as alternative means of livelihood, may be enlarged. Such developments will, according to Party dogma, produce an increase in agricultural labor productivity, although in the past these efforts have frequently had an opposite result in the short run.

VI. Population and Standard of Living.

During 1951-55 the population of the USSR grew by 16.3 million to a total of nearly 220 million, or a gain of approximately 8 percent. The population of the US in 1955 was approximately 165 million. By the end of 1960 the population of the USSR will be nearly 236 million, a gain of a further 7 percent.

According to the Sixth Five Year Plan, there will be 55 million "workers and employees" in 1960, an increase of nearly 15 percent above the total for 1955. The category "workers and employees" includes both the nonagricultural labor force and the labor force employed in state agriculture. State agriculture employed an estimated 5.5 million at the end of 1955.

During the period 1951-55 the nonagricultural labor force grew by an estimated 15 percent. During 1956-60 the planned increase appears to be about 14 percent; however, the Plan calls for a growth in the industrial labor force of only 11 percent. Comparison of these data indicates a high rate of growth planned for aggregate nonagricultural employment other than industrial employment. Nevertheless, the Plan does not specifically indicate substantial increases in labor force planned for construction, transport, or other nonagricultural sectors; hence it is likely that an unallocated labor reserve is included in the aggregate figure for this category. Employment of this labor in industry would enable fulfillment of the production plans despite significant nonfulfillment of labor productivity plans.

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The Sixth Five Year Plan establishes output goals in industry for 1960 which in terms of percentage are much higher than planned additions to the labor force. They must be met by either sharply increasing the productivity per worker or on a selective basis, by the transfer of labor from less essential sectors to priority sectors. Productivity per worker in industry is to increase 50 percent, as compared with the planned increase of 65 percent for industrial production. Productivity is to increase 52 percent in building, 34 percent in rail transport, 40 percent in sea transport, 70 percent in state agriculture, and 100 percent in the collective farms. According to Khrushchev in his February 1956 speech, although Soviet agriculture probably will never reach the productivity of US agriculture, there is much need for improvement. A comparison of the planned increases for agricultural productivity with scheduled increases in agricultural production indicates that there will be little increase in the agricultural labor force during 1956-60, the major resettlement effort being largely completed. There may be, however, transfers of labor from the collective farms to state agriculture. The number and quality of supervisory and technical personnel may be expected to increase.

On the whole, with the exception of agriculture, the goals for increased labor productivity are similar to those of the Fifth Five Year Plan.* In the new Plan, however, there is increased emphasis upon increasing output per producing machine, as the result of the replacement of inefficient machines, the use of advanced technological improvements, and the increased specialization of producing enterprises. Automation in the sense of mechanized production control systems is but a part of this whole effort. Recent Soviet speeches appear to use automation in a somewhat more ambiguous sense as a colorful word signifying this whole new effort.

The new drive for increased productivity has major implications for capital investment because a larger share of future increases in the volume of production will result from the modernization or increased capacity of existing plants. A larger share of capital investment will go to equipment.

As usual, the increase in wages and in the income of collective farmers is to lag behind the increase in the value of output per worker or collective farmer. This withheld income goes to the state to finance investment and defense. Productivity is to increase 50 percent and real wages 30 percent per worker in industry. In the Fifth Five Year Plan, increases of 50 percent in productivity and 35 percent

* The goals are similar only in terms of annual labor productivity. The planned reduction of the work week by 1960 would require a 70 percent increase in industrial production per man-hour over 1955.

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in real wages were planned.* In the new Plan, the collective farm member is to produce 100 percent more, but his income is to increase 40 percent. This is a somewhat less favorable share of the increased output than is allowed the wage earner.

Although the rise in living standards will be moderate in the 1956-60 period, two new programs will be of great psychological importance to the average Russian. These are the 41-hour week and the new housing program.

The 41-hour week was launched as a goal of the Sixth Five Year Plan in Khrushchev's speech before the Party Congress on 14 February 1956. It is to be introduced on a gradual basis starting in 1957, and the program is to be completed by 1960. Assuming progressive introduction of the program at a steady rate, the net impact on the average hours per worker-year during 1956-60 would be a 6-percent reduction. At the present time, it is difficult to see how this reduction can be accomplished and the plan for industrial production be met unless either the plan for increased labor productivity is overfulfilled or, as would be more likely, additions to the industrial labor force are larger than planned.

Construction of state housing in 1956-60 is planned to almost double that during 1951-55. This program will improve urban housing conditions to a limited extent. It is estimated that living space per urban dweller will increase from 4 square meters in 1955 to 5 square meters in 1960, both because of the increased space and also because of the slower urban population growth planned. Housing conditions on the collective farms are to be improved by an intensified program of private construction, performed largely by special housing brigades on the collectives and financed ultimately by the collective farm member assisted by special banks or credit arrangements.

The Plan projects further expansion of the social security and medical programs. In education, two major goals are the extension of 10-year schools to the towns and rural areas, conversion from 7- to 10-year schools having been accomplished already in city areas; and intensified specialized advanced training to increase the numbers of skilled workers, technicians, and scientists in support of the accelerated emphasis upon technology.

* An actual increase in real wages of 39 percent has been claimed; industrial labor productivity increased 44 percent during 1951-55.

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VII. Capital Investment.

The Sixth Five Year Plan stipulates only that capital investment over the entire period will be 990 billion rubles, 67 percent more than invested during 1951-55, in constant rubles. It seems probable that about 65 percent of the total capital investment, or approximately 640 billion rubles, will be invested in industry. This is the share of capital investment which the 1956 budget allocates to industry and is roughly the share which industry received during 1951-55. During 1956-60, total investment in machinery and equipment will increase 80 percent above the total for 1951-55. As total capital investment is to increase 67 percent, the higher rate of increase for machinery and equipment implies that investment in construction will increase at a rate less than 67 percent and that investment in machinery and equipment will be a larger share of the total. In support of the new emphasis upon reduction of production costs and increased output from existing plants, the construction of new plants will be deemphasized, investment at existing enterprises emphasized, and the share of industrial investment going to equipment will increase from about 33 percent in 1951-55 to nearer 36 percent in 1956-60.

Two aspects of investment at existing enterprises are the replacement of worn equipment with equipment of the same capacity, which will produce at lower costs, and the increasing of actual capacity through the installation of new, more productive processes or by extension of existing plants. The enlargement of the capacity of existing plants is much less expensive, unless expansion is excessive, than the construction of whole new plants on new sites, and this appears to be a major element of consideration, especially when Soviet construction costs are so high in relation to Soviet equipment costs.

On the whole, the new patterns of investment appear rational. Whether the industrial productivity goals will be achieved is yet problematical, because few things are more difficult to predict than the degree to which new technology can be introduced or the effect of such new technology. To a substantial degree the new program goes beyond a program for simple capital replacement, which could be scheduled and predetermined as to effect. Much of the program depends upon the introduction, on a large scale, of relatively advanced technology, a very complex engineering problem. Nevertheless, the program must be followed if the productive resources of the USSR are to be used to the fullest extent.

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Aside from the problems of technological progress, the building, equipping, and modernizing of plants, as planned in the investment program, are within the present ability of the USSR, unless an unforeseen crisis results. The Plan correctly assigns a heavier share of investment to equipment than in the past, in support of the proposed plans for technological improvement and increased labor productivity. Two possible developments bear special attention, however, and may endanger achievement of the productivity goals for industry in general. The first development would be an undersupply of instruments to industry such as could result should military requirements be larger than planned. The second would be an underestimation of capital investment in the machine construction industry itself, as the targets of the new Plan rely predominantly upon increasing output from existing plants.

A substantial part of the new investment is directed toward investment in energy and raw materials, and in the area east of the Urals. Investment in machine construction appears to be increasing at a low rate in relation to the production goals. The machine construction industry is relying in many cases upon substantial production increases from relatively small capital investment in support of the introduction of new technology and capital replacement in existing plants. Should this be too optimistic, heavy additional capital expenditure would be required for the construction of additional new plants. In general, however, the capital investment program should be fulfilled substantially.

VIII. Eastward Extension of Industry.

In the Sixth Five Year Plan, which emphasizes the development of natural resources and energy sources, a substantial effort is directed toward the development of natural resources east of the Urals. Although the movement of industry eastward is not new, the years 1956-60 will see a new intensification of this effort. The agricultural development of the "new lands" as a byproduct will help to prepare a food base for an enlarged urban population in years to come.

The new hydroelectric power development is concentrated in the area east of the Urals. Khrushchev stated in his address to the 20th Congress of the Communist Party: "Within the next 10 years we must make Siberia a leading producer of coal and electricity in the Soviet Union and the principal center of industries consuming a great deal of fuel and power -- especially industries producing aluminum, magnesium, and titanium as well as [a center] of the electrometallurgical, coke by-products, and electrochemical industries." The Plan is a long-term

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one, foreseeing the creation in Siberia within 10 or 15 years of a metallurgical center producing 15 million to 20 million tons of pig iron annually.

During 1956-60, half of the capital investment in the USSR is to be invested in areas east of and including the Urals. There is to be greatly increased construction activity in Kazakhstan. In Petropavlovsk a foundry, an ore-concentrating combine, and a rolling equipment plant are to be constructed. An aluminum plant, a ferrous metallurgical plant, and a plant for the construction of agricultural combines are to be built at Pavlodar. Two large blast furnaces and a continuous sheet rolling mill are to be constructed at Karaganda. In addition, several chemicals plants and engineering plants will be constructed in Kazakhstan.

In Siberia, 3 new aluminum plants will be constructed as well as oil refineries, 5 new machine-tool construction plants, 6 metal-forming equipment plants, 8 construction and transport equipment plants, 1 electric locomotive plant, and several chemicals plants.

A substantial nucleus of an aircraft industry in Siberia probably will be further enlarged if increased supplies of aluminum, fuels, titanium, magnesium, synthetic rubber, and other basic materials are available from new plants going up in the area.

Major new railroads which are projected will improve transport facilities within the new industrial areas. The new line from Magnitogorsk westward to Abdulino will improve transport between both the Urals and Karaganda and the areas in the west. The new lines Krasnoufimsk-Kurgan, Omsk-Barnaul, and Stalinsk-Abakan will improve transport capabilities within the area and eventually will help relieve pressure upon the Trans-Siberian Railroad, which they and other existing lines parallel.

Continuing, long-term development of the areas east of the Urals is a major assignment of the State Planning Commission and assumes great importance not only from economic considerations but also from the point of view of defense.

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